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10/574,762

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EXAMINER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/574,762  
Filing Date: October 10, 2006  
Appellant(s): SAITO ET AL.

\_\_\_\_\_  
Shinichiro Saito et al.  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed June 6, 2010 appealing from the Office action mailed February 22, 2010

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

**Claim 1-8** (rejected and on appeal)

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any

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advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS."

New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

### **(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

### **(8) Evidence Relied Upon**

US 6,126,014	Gray	10-2000
US 6,068,131	Styron	05-2000

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Styron et al., U.S. Patent Number 6,068,131 in view of Gray et al., U.S. Patent Number 6,126,014.
4. With regard to Claim 1, Styron et al. teach a method of removing unburned carbon from fly ash comprising the steps of:  
adding water to fly ash to produce slurry (Column 3, lines 32-34, Column 4, line 1);  
adding collector (conditioning agent) to said slurry (Column 4, lines 4-5);  
feeding said slurry and collector to a submerged agitator (immersed in conditioning tank) (Column 4, lines 15-16);  
adding frother (flotation reagent) to said slurry and said collector to which the shearing force is added (Column 4, lines 10-11);  
agitating said slurry and said collector to generate air bubbles (aerated) (Column 4, lines 18-23);  
and adhering unburned carbon of said fly ash to the air bubbles to rise said unburned carbon (Column 4, lines 19-23).

Styron et al. do not teach a submerged agitator having a rotation shaft penetrating a cylindrical main body in an axial direction thereof, plurality of chambers formed by dividing an inside of the main body in the axial direction thereof and an agitating vane fixed to the rotation shaft and rotating in each chamber, and to apply a shearing force to said slurry and said collector to modify

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the surface of said unburned carbon and said collector to enhance adsorption of said unburned carbon to said collector.

In an analogous art of carbon ash beneficiation, Gray et al. teach a cylindrical main body in an axial direction thereof, plurality of chambers formed by dividing an inside of the main body in the axial direction thereof and an agitating vane fixed to the rotation shaft and rotating in each chamber, and adding shearing force (inherent to any agitation acting perpendicular to its longitudinal axis) to said slurry and collector for the benefit of increasing carbon yield for the improvement of carbon fly ash beneficiation (Gray, Figure 1 and Column 4, lines 54-58).

It would have been obvious to one of ordinary skill in the art at the time of invention to include the Gray agitator characterized by its rotation shaft penetrating the cylindrical main body in an axial direction thereof, plurality of chambers, and multiple vanes in the Styron apparatus for the benefit of increasing carbon yield for the improvement of carbon ash beneficiation.

The combination does not teach applying a shearing force to said slurry and said collector to modify the surface of said unburned carbon and said collector to enhance adsorption of said unburned carbon to said collector.

However, since agitation acting perpendicular to its longitudinal axis is taught, shearing force is inherent, and it meets the claim. The motivation for which the agitation and ultimately the shearing force is applied is not relevant.

With regard to Claim 2, the art combination does not explicitly teach a method of removing unburned carbon from fly ash wherein said agitating force

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when the submerged agitator add shearing force to said slurry and said collector is 0.7 kWh/m<sup>3</sup> or more and 10 kWh/m<sup>3</sup> or less per unit quantity of slurry.

However, such rates are well known and are result effective variables.

Where the general conditions of a claim are disclosed in the prior art it is not inventive to discover the optimum or workable ranges by routine experimentation. It would have been obvious to one of ordinary skill in the art at the time of invention to recognize that the amount of force being claimed is merely a design choice and the amount (force) of agitation would have been optimized to provide adequate shearing force to the slurry and collector.

With regard to Claim 3, Styron et al. teach a method of removing unburned carbon from fly ash wherein the concentration of said fly ash in the slurry is 0.1 percent to 70 percent (which reads on the claimed 3 weight percent or more and 50 weight percent or less). (Styron, Column 4, lines 1-2)

With regard to Claim 4, Styron et al. teach a method of removing unburned carbon from fly ash wherein the amount of said collector added is 0.1 lbs/ton (0.00499 wt %) to 10 lbs/ton (0.4975 wt %) which reads on 5 weight percent or more, and 100 weight percent or less of amount of said unburned carbon of said fly ash (Styron, Column 4, lines 7-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to so include the claimed ranges since the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

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With regard to Claim 5, Styron et al. do not teach the method of removing unburned carbon from fly ash further comprising the steps of separating with a solid/liquid separation device water of fly ash slurry that is separated through flotation, and water separated is added to new fly ash or/and the water is used to erase bubbles when adhering unburned carbon to air bubbles, for purpose of reuse.

In an analogous art of carbon ash beneficiation, Gray et al. teach the method of removing unburned carbon from fly ash further comprising the steps of separating with a solid/liquid separation device, water of fly ash slurry that is separated through flotation, and water separated is added to new fly ash or/and the water is used to erase bubbles when adhering unburned carbon to air bubbles, for purpose of reuse (Gray, Column 5, lines 11-23 and Figure 1).

It would have been obvious to one of ordinary skill in the art at the time of invention to include the steps of using a solid/liquid separation device to separate the water of the fly ash slurry included in Gray et al.'s disclosure in the Styron apparatus for the benefit of recycle and reuse for the improvement of carbon ash beneficiation.

With regard to Claim 6, the method of removing unburned carbon from fly ash wherein said unburned carbon is used as fuel is well known and would have been obvious to so include for any conventional use envisioned by the practitioner.



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With regard to Claim 7, Styron et al. teach a method of removing unburned carbon from fly ash wherein said unburned carbon content in said fly ash is 1 weight percent or less and the fly ash is used as a mixing material for cement (concrete applications) (Styron, Column 4, lines 26-28).

With respect to claim 7, the claimed limitation of 1 wt % or less of unburned carbon content in said fly ash reads on 0 wt %. Although Styron et al. are silent to the content of unburned carbon, note that where the general conditions of the claim are disclosed in the prior art, it is not inventive to disclose the optimum or workable ranges by routine experimentation.

With regard to Claim 8, Styron et al. teach a method of removing unburned carbon from fly ash as claimed one of claims 1 to 6, wherein said unburned carbon content of in fly ash separated through flotation is 1 weight percent or less and the fly ash is used as a material for manufacturing lightweight aggregate (coke, charcoal, briquets) (Styron, Column 4, lines 24-26).

With respect to claim 8, the claimed limitation of 1 wt % or less of unburned carbon content in said fly ash reads on 0 wt %. Although Styron et al. are silent to the content of unburned carbon, note that where the general conditions of the claim are disclosed in the prior art, it is not inventive to disclose the optimum or workable ranges by routine experimentation.

#### **(10) Response to Argument**

5. With respect to the prior art rejections, applicant argues that the combination of the references do not disclose a method including the step of

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applying a shear force to modify the surface of unburned carbon and collector to enhance absorption of the unburned carbon to the collector. Further, it is asserted that Gray teaches agitation for the purposes of **dispersing** the hydrocarbon slurry within the aqueous solution and **not for modifying the surface** of unburned carbon and collector. The examiner disagrees and reasserts that since agitation acting perpendicular to its longitudinal axis is taught, shearing force, as well as **modification of the surface of any substance present and being subjected to agitation in the mixer, is inherent**, and it meets the claim. The motivation for which the agitation and ultimately the shearing force is applied is not relevant.

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

/Tiffany N. Palmer/

Examiner Art Unit 1797

/Duane Smith/

Supervisory Patent Examiner, Art Unit 1797

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